

North Carolina Cooperative Extension Service



Water Quality & Waste Management

Worms Can Recycle Your Garbage

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North Carolina's estimated 420,000 tons of food waste are buried or burned each year at considerable financial and environmental cost. Instead of discarding your food scraps, you can recycle them with the help of worms. Vermicomposting (worm composting) turns many types of kitchen waste into a nutritious soil for plants. When worm compost is added to soil, it boosts the nutrients available to plants and enhances soil structure and drainage.

Using worms to decompose food waste offers several advantages:

- It reduces household garbage disposal costs;
- It produces less odor and attracts fewer pests than putting food wastes into a garbage container;
- It saves the water and electricity that kitchen sink garbage disposal units consume;

- It produces a free, high-quality soil amendment (compost);
- It requires little space, labor, or maintenance;
- It spawns free worms for fishing.

Equipment and Supplies

The materials needed to start a vermicomposting system are simple and inexpensive. All you will need are a worm bin, bedding, water, worms, and your food scraps. **Worm Bin.** A suitable bin can be constructed of untreated, nonaromatic wood, or a plastic container can be purchased. If a plastic container is used, it should be thoroughly washed and rinsed before worms and bedding are added. The bin size depends on the amount of food waste produced by your household. For two people (producing approximately 3 1/2 pounds of food scraps per week), a box 2 feet wide, 2 feet long, and 8 inches deep should be adequate. A 2-foot-by-3-foot box is suitable for four to six people (about 6 pounds of waste per week). Redworms (the type used for vermicomposting) thrive in moist bedding in a bin with air holes on all sides. For aeration and drainage, drill nine 1/2-inch holes in the bottom of the 2-foot-by-2-foot bin or 12 holes in the 2-foot-by-3-foot bin. Place a plastic tray under the worm bin to collect any moisture that may seep out. Keep a lid on the bin, as worms like to work in the dark. Locate the worm bin where the temperature remains between 55° and 77°F. (An indoor location is preferable.)

Bedding. The worms need bedding material in which to burrow and to bury the garbage. It should be a nontoxic, fluffy material that holds moisture and allows air to circulate. Suitable materials include shredded paper (such as black-and-white newspapers, paper bags, computer paper, or cardboard); composted animal manure (cow, horse, or rabbit); decaying leaves; or peat moss (which increases moisture retention). Add two handfuls of soil to supply roughage for the worms. Adding crushed eggshells provides not only roughage but also calcium for the worms, and it lowers acidity in the bin. About 4 to 6 pounds of bedding is needed for a 2-foot-by-2-foot bin (for two people), and 9 to 14 pounds of bedding should be used in a 2-foot-by-3-foot bin (for four to six people).

Water. To keep bedding moist, add 3 pints of water for each pound of bedding. You will need about 1 1/2 to 2 1/4 gallons of water for 4 to 6 pounds of bedding.

Worms. It is important to get the type of worms that will thrive in a worm bin. Only redworms or "wrigglers" (*Eisenia foetida*) should be used (do not use nightcrawlers or other types of worms). Worms can be obtained from bait shops, nurseries, or by mail from commercial worm growers; the commercial growers are the most reliable source. Add 1 pound of worms to the 2-foot-by-2-foot bin or 2 pounds of worms to the 2-foot-by-3-foot bin.

Food Scraps. Feed your worms any nonmeat organic waste such as vegetables, fruits, eggshells, tea bags, coffee grounds, paper coffee filters, and shredded garden waste. Worms especially like cantaloupe, watermelon, and pumpkin. Do not add meat scraps and bones, greasy foods, fat, tobacco, or pet waste.

Starting the Process

To start your vermicomposting system, first select a location for your worm bin, such as the basement, garage, or kitchen. Soak the bedding in a bucket overnight so that it is moist but not soggy. Place the bedding evenly into the worm bin and gently add the worms to the surface of the bedding. Keep the bin lid off for 1 to 2 hours so that the worms will move away from the light and burrow into the bedding.

Once the worms have settled into their new home, add food scraps. It is best to dig a hole in the bedding, place waste in the hole, and cover it with about 1 inch of bedding. Bury food scraps in a different area of the bin each time. Worms may be fed any time of the day. Do not worry if you must leave for a few days, as the worms can be fed as seldom as once a week.

Harvesting the Worms and Compost

In three to four months, your worms will have turned the food scraps and bedding into a dark, rich, soil-like material called vermicompost. This material can be mixed into the soil in your garden and around your trees and yard plants. It can also be added to potting soil for your houseplants.

To harvest the vermicompost, push all of the bedding to one side of your worm bin. Place new, moist bedding (half of the original amount of bedding) on the empty side, and add food scraps only to the new bedding. Within about four weeks, all of the worms will have moved into the new bedding and left finished compost on the old bedding side. Remove the compost and replace it with new bedding (half of the original amount). Now you can begin adding food scraps to both sides of the bin again. Repeat this process every three to five months.

Managing Your Worm Bin

Here are some other things you should know about your vermicomposting system.

- If too much food is added, the system can become overloaded and cause an odor. The odor will dissipate if you stop adding food until the worms catch up.
- Providing adequate oxygen and not too much moisture also minimizes odors.
- If fruit peels are buried completely, fruit flies will not be attracted to the bin.
- When worms reproduce, they create matchhead-sized cocoons. Do not disturb them.
- Do not use your worm bin as a cat litter box, and do not add dog or human manure to the bin.
- Do not be surprised to see other creatures in your worm bin, as they help break down the organic material. Most of the organisms will be too small to see, but you may spot white worms, springtails, pill bugs, molds, mites, and fruit flies.

Large-Scale Vermicomposting

Vermicomposting can take place wherever food scraps are generated or delivered. Worm composting bins can be found in classrooms, apartments, offices, and other commercial locations. Large-scale worm farms are found in some states, including California, Rhode Island, and Oregon. Worms even compost the food waste produced at the Seattle Kingdome stadium. Classrooms and outdoor centers are especially nice settings for worm composting. Children of all ages enjoy classroom activities involving worms. Curricular materials for grades 4 through 8 may be found in a 232-page book entitled *Worms Eat Our Garbage*. Activities in the book can be used in a multitude of disciplines, including science, mathematics, geography, language arts (vocabulary, poetry, and prose), and music.

Sources of Additional Information and Supplies

Supplies

Flowerfield Enterprises, 10332 Shaver Road, Kalamazoo, Michigan 49002; telephone (616) 327-0108. Offers worms, bedding, bins, and books, including *Worms Eat My Garbage* (a guide to setting up and maintaining a worm composting system) and *Worms Eat Our Garbage* (a curriculum guide for school and outdoor centers).

Carolina Biological Supply, 2700 York Road, Burlington, North Carolina 27215; telephone (800) 334-5551. Offers worms, bedding, and bins.

The Worm Concern, 580 Erbes Road, Thousand Oaks, California 91362; telephone (800) 854-1244 or (805) 520-1150. Sells vermicompost, worms, bedding, bins, books, plants, mulch, natural pest predators, and other products.

Local Information Resources

North Carolina Cooperative Extension Service

Contact your county Cooperative Extension Center or:

Department of Biological & Agricultural Engineering
North Carolina State University
Box 7625
Raleigh, NC 27695-7625
Attention: Rhonda Sherman
Telephone (919) 515-6770

North Carolina Office of Waste Reduction

P.O. Box 27687
Raleigh, NC 27611-7687
Telephone (919) 571-4100 or (800) 763-0136

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